

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

Aircraft Certification Service
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Of Transportation

**Federal Aviation
Administration**

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This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin advises you, owners and operators of Embraer EMB-135 and EMB-145 series airplanes, of certain recommended actions that may prove to be significant to the continued airworthiness of the airplanes.

Background

The Departamento de Aviacao Civil (DAC), which is the airworthiness authority for Brazil, notified the FAA that a service difficulty condition may exist on certain EMBRAER Model EMB-135 and -145 series airplanes. The DAC advises that several operators have reported temporary loss of the pitch trim command during the climb after take-off, which may result in significant difficulties controlling the airplane. However, the airplane has been demonstrated during original certification to be controllable with the pitch trim system inoperative provided the flight crew follows the AFM procedure, "PITCH TRIM INOPERATIVE" located in the Emergency Procedure section.

In addition to the service difficulty condition described above, there have been other service issues with the pitch trim system identified in the past. To correct these previous difficulties, EMBRAER has issued the following service bulletins to modify the pitch trim system for the EMB-135() and EMB-145() series airplanes.

1. 145LEG-27-0002, and 145-27-0084; which describe procedures for replacing the horizontal stabilizer control unit (HSCU) with a new unit with improved features, and having a new part number. SB 145-27-0084 specifies that SB 145-27-0091 must be accomplished either previously or concurrently with the replacement of the HSCU.
2. SB's 145LEG-27-0002 and 145-27-0084, also describe procedures for connecting the HSCU and the data acquisition unit (DAU) (including the replacement of the pitch trim system circuit breakers with new circuit breakers sized for the new system load capacity, as applicable). These service bulletins specify that SB 145-31-0028 must be accomplished either previously or concurrently with the connection of the HSCU and the DAU.
3. SB 145-27-0091, describes procedures for replacing the horizontal stabilizer actuator (HSA) with a new HSA having a new part number.

4. SB 145-31-0028 describes procedures for replacing the aural warning unit (AWU) with an AWU having improved features and a new part number. This SB specifies that SB 145-34-0046 must be accomplished either previously or concurrently. This service bulletin also references Grimes Aerospace Company SB 80-0694-33-SB01, as an additional source of service information for accomplishment of the replacement. The Grimes Aerospace SB is included in the EMBRAER service bulletin.
5. SB 145LEG-31-0001, and 145-31-0033, describe procedures for replacing any Integrated Computer (IC) units having certain part numbers with new units having new modification letters and new part numbers. These SBs also describe procedures for installing an updated version of the software for the Engine Indicating and Crew Alerting System/Electronic Flight Information System. SB 145-31-0033 specifies that SB 145-31-0020, and 145-27-0084, must be accomplished either previously or concurrently. SB 145LEG-31-0001 and 145-31-0033 reference Honeywell SB 7017000-22-6089, as an additional source of service information for accomplishment of the replacement and installation.
6. SB 145LEG-27-0004, and 145-27-0096, describe procedures for replacing the control yoke pitch trim switch with a new switch having a new part number; and procedures for replacing the placard around the switch knob, as applicable, with a new placard having a new part number.
7. SB 145-27-0073, describes procedures for replacing the pitch trim back-up control switch with a new switch having a new part number (including re-identifying the trim control panel).

The DAC classified these service bulletins as mandatory and issued Brazilian airworthiness directive 2003-03-01 to ensure the continued airworthiness of these airplanes in Brazil.

The FAA's Transport Airplane Directorate (TAD) has issued a Notice Of Proposed Rulemaking (NPRM) similar to the Brazilian AD 2003-03-01. The NPRM was published in the Federal Register Friday, February 6, 2004, Docket Number 2003-NM-97-AD. The comment period will close March 8, 2004.

This SAIB is prompted by Operators reports of dual pitch trim channel shutdown after accomplishing the modifications listed above. Embraer issued Operational Bulletin Number 145-005/03 dated December 8, 2003 alerting the operators about these events. The dual channel shutdown events are associated with airplanes equipped with the Horizontal Stabilizer Control Unit (HSCU) Part Numbers (P/N) 362100-1009, -5009 and -1011. This new shutdown event is triggered by a very brief miss comparison of airspeeds between the two air data computers as a result of a minor software problem with these HSCU's. The airspeed miss compare may occur during turbulent conditions, and at airspeeds between 160 to 250 knots. The shutdown will trigger EICAS messages of "PTRIM MAIN INOP" and "PTRIM BACKUP INOP" or "PT TRIM 1-2 INOP". Both pitch trim systems can be brought back online by powering down the pitch trim system, cycling the circuit breakers and then powering the system back up.

The manufacturer Embraer has is developing a design modification to the HSCU to correct this problem, which should be available in April of this year. The International Branch, ANM-116 of the FAA's TAD will evaluate this design modification to determine if any additional action is necessary or if an airworthiness directive is required to mandate this modification.

Recommendations

The FAA highly recommends US Operators of the Embraer EMB-135 and EMB-145 series airplanes to follow the attached procedures if they experience a shutdown of both the primary and backup pitch trim. Each US airline should work with their controlling Flight Standards Office to ensure the intent of these procedures are incorporated into their Airplane Operating Manual or similar document.

This SAIB is applicable to all US type certificated EMB-135 and EMB-145 series airplanes that are affected by the Brazilian AD, Embraer Service Bulletins listed above and NPRM 2003-NM-97-AD.

For Further Information Contact

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**EMBRAER EMB-135/145
Series Airplanes**

**TEMPORARY PROCEDURE
FOR
DUAL PITCH TRIM INOPERATIVE –
CIRCUIT BREAKER CYCLING**

IF BOTH PITCH TRIM SYSTEMS ARE INOPERATIVE:

Quick Disconnect Button	PRESS AND HOLD
Pitch Trim Main System	OFF
Pitch Trim Back Up System	OFF
Quick Disconnect Button	RELEASE

NOTE: In case any affected Circuit Breaker (F11 or C24) is popped, a reset must not be performed.

At a safe altitude:

Pitch Trim Circuit Breaker (F11 and C24)	PULL & RESET
Pitch Trim Back Up System	ON
Back Up Pitch Trim Switch.....	CHECK SWITCH

NOTE: The Pitch Trim circuit breakers may only be pulled and reset once.

If Back Up Pitch Trim command is re-established continue the flight with that Pitch Trim System.

NOTE: The Autopilot will not be available.

If pitch trim command is not re-established:

Pitch Trim Back Up System	OFF
Pitch Trim Main System	ON
Main Pitch Trim Switches.....	CHECK SWITCHES

If Main Pitch Trim command is re-established continue the flight with that Pitch Trim System.

If pitch trim command is not re-established:

Quick Disconnect Button	PRESS AND HOLD
Pitch Trim Main System	OFF
Pitch Trim Back Up System	OFF
Quick Disconnect Button	RELEASE

Consider landing at the nearest suitable airport in accordance with the FAA Approved Airplane Flight Manual Procedures For Pitch Trim In-Operative

ANOTHER TAKEOFF IS NOT PERMITTED UNTIL APPROPRIATE MAINTENANCE ACTION HAS BEEN ACCOMPLISHED.